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Organochlorine Pesticide Contamination and Its Potential Effects On Eggshell Thickness and Coloration in Dickcissels (*Spiza Americana*)

Matthew Anderson

Illinois Wesleyan University

Bridget Wall, '08

Illinois Wesleyan University

Toritseju Eshedagho, '09

Illinois Wesleyan University

Given Harper, Faculty Advisor

Illinois Wesleyan University

Jeffrey Frick, Faculty Advisor

Illinois Wesleyan University

See next page for additional authors

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Presenter Information

Matthew Anderson; Bridget Wall, '08; Toritseju Eshedagho, '09; Given Harper, Faculty Advisor; Jeffrey Frick, Faculty Advisor; and Brian Peer, Faculty Advisor

Poster Presentation P3

**ORGANOCHLORINE PESTICIDE CONTAMINATION AND ITS POTENTIAL EFFECTS ON
EGGSHELL THICKNESS AND COLORATION IN DICKCISSELS (*SPIZA AMERICANA*)**

Matthew Anderson, Bridget Wall, Toritseju Eshedagho and
Given Harper,* Jeffrey Frick* and Brian Peer*
Biology and Chemistry Departments, Illinois Wesleyan University
Biology Department, Western Illinois University

Dickcissels (*Spiza americana*), which are small seed-eating birds in the family Cardinalidae, breed in the grasslands of the Midwestern United States and winter mostly in Venezuela. Farmers in Venezuela intentionally spray dickcissel flocks with pesticides in an attempt to kill them when they feed in rice fields. Dr. Brian Peer, a graduate of Illinois Wesleyan University and a professor and avian ecologist at Western Illinois University, noticed that the eggs of some dickcissels seemed to break easily when handled. Previous studies have shown that organochlorine (OC) pesticide contaminants (e.g., DDT) have significantly reduced eggshell thickness in eagles and falcons. The purpose of this study is to determine if OC contamination contributes to a decrease in dickcissel eggshell thickness. In addition, we are trying to determine if OC pesticides may also influence dickcissel eggshell coloration, which may be used by males to assess female quality, and thus determine the amount of care they will provide to the resulting offspring.

Dickcissel eggs were collected in Illinois and Iowa during the summers of 2004, 2005, and 2006 with the necessary permits. Egg collection has minimal impact on dickcissel populations. The presence of sixteen OC compounds was tested for using gas chromatography and eggshell thickness was measured using a thickness indicator. Eleven OC compounds were present in dickcissel eggs and p,p,-DDE was the most frequently detected compound [present in 17/112 eggs; minimum ^ maximum levels: 0 ^ 418 parts per billion (ppb)]. There was a significant negative relationship between eggshell thickness and levels of total OC compounds ($F_{1,74} = 4.638$, $p = 0.035$; minimum ^ maximum levels: 0 ^ 2,349 ppb). These results suggest that OC pesticide contamination may play a role in decreased reproductive success of dickcissel and declines in their populations. Digital photographs were taken under fluorescent lighting and the hue, saturation, and brightness of eggshell segments are currently being analyzed using Adobe Photoshop.